

AMENDMENTS TO THE CLAIMS

This is a complete and current listing of the claims, marked with status identifiers in parentheses. The following listing of claims will replace all prior versions and listings of claims in the application.

1. (Original) A water absorbent comprising water-absorbing resin particles, which are surface cross-linked and prepared from a water-absorbing resin having a cross-linked structure prepared by polymerizing a monomer including at least acrylic acid and/or its salt, the water absorbent satisfying:

(a) 90% by weight or more of the particles have a diameter less than $850\mu\text{m}$ but not less than $150\mu\text{m}$;

(b) a logarithmic standard deviation (σ/ζ) of the particle size distribution is in a range of 0.25 to 0.45;

(c) AAPs for 0.9 wt% saline is 20 g/g or more;

(d) CRCs for 0.9 wt% saline is not less than 29 g/g but less than 39 g/g;

(e) a chemical cross-linking index is 160 or more, the chemical cross-linking index represented by Formula (1):

Chemical Cross-Linking Index

$$= (\text{CRCs})/(\text{CRCdw}) \times 1000 \dots (1),$$

where CRCs (g/g) is an absorbency for 0.9 wt% saline, and CRCdw (g/g) is an absorbency for deionized water.

2. (Original) The water-absorbent as set forth in Claim 1 wherein the chemical cross-linking index is 170 or more.

3. (Original) A water absorbent comprising water-absorbing resin particles, which are surface cross-linked and prepared from a water-absorbing resin having a cross-linked structure prepared by polymerizing a monomer including at least acrylic

acid and/or its salt, the water absorbent satisfying:

(a) 90% by weight or more of the particles have a diameter less than $850\mu\text{m}$ but not less than $150\mu\text{m}$;

(b) a logarithmic standard deviation (σ) of the particle size distribution is in a range of 0.25 to 0.45;

(c) AAPs for 0.9 wt% saline is 20 g/g or more;

(f) CRCs for 0.9 wt % saline is not less than 15 g/g but less than 29 g/g;

(g) a chemical cross-linking index against pressure is 100 or more, the chemical cross-linking index against pressure represented by Formula (2):

$$\begin{aligned} &\text{Chemical Cross-Linking Index Against Pressure} \\ &= (\text{CRCs}) + (\text{AAPdw}) \dots (2), \end{aligned}$$

wherein CRCs (g/g) is an absorbency for 0.9 wt% saline, and AAPdw (g/g) is an absorbency against pressure for deionized water.

4. (Original) The water absorbent as set forth in Claim 3, wherein the chemical cross-linking index against pressure is 115 or more.

5. (Currently Amended) The water absorbent as set forth in ~~any one of Claims 1 to 4~~ Claim 1, containing a phosphorus atom.

6. (Currently Amended) The water absorbent as set forth in ~~any one of Claims 1 to 5~~ Claim 1, wherein the water absorbent has Saline Flow Conductivity (SFC) in a range of 30 to 3000 ($10^{-7}\cdot\text{cm}^3\cdot\text{s}\cdot\text{g}^{-1}$) or more.

7. (Currently Amended) The water absorbent as set forth in ~~any one of Claims 1 to 6~~ Claim 1, wherein the water absorbent has Saline Flow Conductivity (SFC) in a range of 30 to 3000 ($10^{-7}\cdot\text{cm}^3\cdot\text{s}\cdot\text{g}^{-1}$) or more.

8. (Currently Amended) The water absorbent as set forth in ~~any one of Claims 1 to 7~~ Claim 1, comprising a liquid permeability improver (F).

9. (Original) The water absorbent as set forth in Claim 8, wherein the liquid permeability improver (F) is a multivalent metal compound.

10. (Original) A method of producing a water absorbent containing water-absorbing resin particles, which are surface cross-linked and prepared from a water-absorbing resin prepared by cross-linking polymerization of a monomer including acrylic acid and/or its salt, wherein:

the water absorbing resin has Swelling Pressure of Gel Layer (SPGL (B)) of 35.0 (kdyne/cm²) or more;

the particles has such a particle size distribution that 95% to 100% by weight of the particles have a diameter less than 850 μ m but not less than 106 μ m, the particle size distribution measured by JIS standard sieve; and

a logarithmic standard deviation ($\sigma \zeta$) of the particle size distribution is in a range of 0.25 to 0.45.

11. (Original) A method of producing a water absorbent containing water-absorbing resin particles, which are surface cross-linked and prepared from a water-absorbing resin prepared by cross-linking polymerization of a monomer including acrylic acid and/or its salt, wherein:

the cross-linking polymerization is a boiling polymerization that is carried out in the presence of a water-soluble chain transfer agent of 0.001mol% to 10mol% with respect to the monomer to be polymerized by the boiling polymerization.

12. (Currently Amended) The method as set ~~forth~~ forth in Claim 10 ~~or 11~~, wherein:

the water absorbing resin has CRCs in a range of 28 to 40 (g/g), and Swelling

Pressure of Gel Layer (SPGL (B)) of 40.0 (kdyne/cm²) or more.

13. (Currently Amended) The method as set forth in ~~any one of Claims 10 to 12~~ Claim 10, wherein:

the water-absorbing resin is surface cross-linked until the water-absorbing resin has Saline Flow Conductivity (SFC) of 40 (10⁻⁷·cm³·s·g⁻¹) or more, and then adding a liquid permeability improver to the water-absorbing resin.

14. (Currently Amended) The method as set forth in ~~any of Claims 11 to 13~~ Claim 11, wherein:

the particles have such a particle size distribution that 95% to 100% by weight of the particles have a diameter less than 850μm but not less than 106μm, the particle size distribution measured by JIS standard sieve; and

a logarithmic standard deviation ($\sigma \zeta$) of the particle size distribution is in a range of 0.25 to 0.45.

15. (Currently Amended) The method as set forth in ~~any one of Claims 10, 12 and 14,~~ Claim 10, wherein:

the monomer contains a water-soluble chain transfer agent by 0.001 mol% to 10 mol% with respect to the monomer to be polymerized.

16. (Currently Amended) The method as set forth in ~~any one of Claims 10 to 15~~ Claim 10, comprising:

further adding a liquid permeability improver of 0.001 parts to 5 parts by weight with respect to 100 parts by weight of the particles.

17. (Currently Amended) The method as set forth in ~~any one of Claims 10 to 16~~ Claim 10, wherein:

every one percent by weight of the liquid permeability improver to the surface

cross-linked water-absorbing resin particles, increases Saline Flow Conductivity (SFC) at a rate of 3.5 time or more.

18. (Currently Amended) The method as set forth ~~any one of Claims 13, 16, and 17~~ Claim 13, wherein:

the liquid permeability improver contains at least one of an inorganic powder or a multivalent metal compound.

19. (Currently Amended) A water absorbent prepared by the method as set forth ~~in Claims 10 to 18~~ Claim 10, comprising:

surface cross-linked water-absorbing resin particles;

a chemical cross-linking index against pressure of the water absorbent being 100 or more, the chemical cross-linking index against pressure represented by Formula (2):

$$\begin{aligned} &\text{Chemical Cross-Linking Index Against Pressure} \\ &= (\text{CRCs}) + (\text{AAPdw}) \dots (2), \end{aligned}$$

where CRCs (g/g) is an absorbency for 0.9 wt% saline, and AAPdw (g/g) is an absorbency against pressure for deionized water.

20. (New) The water absorbent as set forth in Claim 3, containing a phosphorus atom.

21. (New) The water absorbent as set forth in Claim 3, wherein the water absorbent has Saline Flow Conductivity (SFC) in a range of 30 to 3000 ($10^{-7} \cdot \text{cm}^3 \cdot \text{s} \cdot \text{g}^{-1}$) or more.

22. (New) The water absorbent as set forth in Claim 3, wherein the water

absorbent has Saline Flow Conductivity (SFC) in a range of 100 to 250 ($10^{-7}\text{-cm}^3\text{s}^{-1}\text{g}^{-1}$) or more.

23. (New) The water absorbent as set forth in Claim 3, comprising a liquid permeability improver (F).

24. (New) The method as set forth in Claim 11, wherein:
the water absorbing resin has CRCs in a range of 28 to 40 (g/g), and Swelling Pressure of Gel Layer (SPGL (B)) of 40.0 (kdyne/cm²) or more.

25. (New) The method as set forth in Claim 11, wherein:
the water-absorbing resin is surface cross-linked until the water-absorbing resin has Saline Flow Conductivity (SFC) of 40 ($10^{-7}\text{-cm}^3\text{s}^{-1}\text{g}^{-1}$) or more, and then adding a liquid permeability improver to the water-absorbing resin.

26. (New) The method as set forth in Claim 11, wherein:
the monomer contains a water-soluble chain transfer agent by 0.001 mol% to 10 mol% with respect to the monomer to be polymerized.

27. (New) The method as set forth in Claim 11, comprising:
further adding a liquid permeability improver of 0.001 parts to 5 parts by weight with respect to 100 parts by weight of the particles.

28. (New) The method as set forth in Claim 11, wherein:
every one percent by weight of the liquid permeability improver to the surface cross-linked water-absorbing resin particles, increases Saline Flow Conductivity (SFC) at a rate of 3.5 time or more.

29. (New) The method as set forth in Claim 16, wherein:

the liquid permeability improver contains at least one of an inorganic powder or a multivalent metal compound.

30. (New) The method as set forth in Claim 17, wherein:
the liquid permeability improver contains at least one of an inorganic powder or a multivalent metal compound.

31. (New) A water absorbent prepared by the method as set forth in Claim 11, comprising:

surface cross-linked water-absorbing resin particles,
a chemical cross-linking index against pressure of the water absorbent being 100 or more, the chemical cross-linking index against pressure represented by Formula (2):

$$\begin{aligned} &\text{Chemical Cross-Linking Index Against Pressure} \\ &= (\text{CRCs}) + (\text{AAPdw}) \dots (2), \end{aligned}$$

where CRCs (g/g) is an absorbency for 0.9 wt% saline, and AAPdw (g/g) is an absorbency against pressure for deionized water.